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Quality of Life After Stroke in Old Age: Comparison of Persons Living in Nursing Home and Those Living in Their Own Home

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Aim To determine the differences in subjective quality of life between elderly people living in a nursing home and those living in their own homes after brain stroke, and to determine the contribution of demographic variables and different quality of life domains to the explanation of self-assessed quality of life.

Methods The study included 60 elderly men and women, 30 living in their own homes (median age, 81; range, 72-90) and 30 living in a nursing home (median age, 81; range, 72-86). Both groups received care (stationary or ambulatory) from the same nursing home. World Health Organization Quality of Life Questionnaire – short version, self-assessed quality of life questionnaire, and demographic questionnaire were used to collect data on subjective quality of life. The participants completed self-report questionnaires individually.

Results Quality of life scores were significantly higher in the elderly living in a nursing home than in the elderly living in their own home (mean ± standard deviation, 78.7 ± 12.8 vs 59.3 ± 17.3 out of maximum 100, $P < 0.001$). Also, the elderly living in the nursing home scored significantly higher than those living in their own home on all 4 quality of life domains (maximum 100 for each domain): physical (28.5 ± 3.3 vs 17.2 ± 5.0), psychological (22.3 ± 3.7 vs 16.3 ± 5.0), social relationships (11.4 ± 1.6 vs 8.3 ± 1.7), and environment (32.8 ± 4.6 vs 24.0 ± 6.1) domain ($P < 0.001$ for all). All predictive variables together explained 51.9% of quality of life variance, with self-assessed health being the most significant predictor.

Conclusion Quality of life of the elderly in a nursing home was significantly higher than that of their peers living in their own home, which may be related to better care in specially organized settings.

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Quality of life is influenced by a wide range of different factors. Although material status is one of these factors, it is neither an essential nor sufficient precondition for the feeling of satisfaction with life (1). Objective factors, such as social, economic, and political situation influence subjective assessment of the quality of life, but the association between objective and subjective aspects is not linear, ie, a change in objective aspects does not automatically imply a change in subjective aspects (2). If poor social living conditions are improved, subjective perception of satisfaction with life improves, but after a certain point, this association disappears (1,2). If all basic life needs are met, increase in material well-being will not significantly influence the subjective assessment of quality of life (1).

The World Health Organization (WHO) defines quality of life as an individual's perception of his or her position in life in specific cultural, social, and environmental context (3). Quality of life consists of the following main areas: objective environment, environment, behavioral competence (including health), perceived quality of life, and psychological well-being (including life satisfaction) (4). Beside the objective factors, quality of life is influenced by subjective perception and assessment of physical, material, social, and emotional well-being, personal development, and purposeful activity. All these domains are influenced by an individual's personal value system (5).

It has been shown that individuals with serious and persistent disabilities and objectively poor quality of life report having good or satisfactory quality of life, which is also known as the disability paradox (6,7). This is explained by theory of balance, which says that an individual perceives the quality of life as a balance between body and mind (6). On the other hand, the explanation may lie in establishing supportive social relationships during illness (7,8) and developing effective coping strategies (9). Health is the most often reported factor influencing quality of life of elderly people (10-12). However, objective health problems are not always associated with subjective perception of poor health (13). Paying attention to individual context (14,15) could help us to understand this paradox. For example, Browne et al (16) found that self-reported quality of life was higher among very old study participants than among younger ones. Philp (17) holds that the most important aspect of care for the elderly is to increase and maintain quality of life and that, therefore, all factors that increase the quality of life should be identified. As human life is extended, there is a greater number of diseases that make adequate functioning more difficult (18-20), and the association between symptoms, disorders, and everyday activities has not been completely explained. For example, depression in persons without physical disabilities significantly contributes to the decrease in their daily activities and increases their dependence on others (21). Bowling and Brown (22) reported that persons aged over 85 who lived in their own homes in London assessed their health status as an important predictor of emotional well-being, more influential than social network. Persons with poorer social support had lower satisfaction with life (23), and dependence on help from others elicited the feelings of insecurity and anxiety about future and especially about continued availability of persons that provide help (24). Quality of life is influenced by socio-demographic factors, level of help, variety of activities, and social and environmental factors (23,25-27). Socio-economic indicators contribute relatively little to the model (28).

The aim of our study was to determine the differences in self-assessed quality of life between elderly people living in the nursing home and elderly people living in their own homes after stroke and to determine predictive contribution of demographic variables and different quality of life domains to the explanation of subjective quality of life.

PARTICIPANTS AND METHODS

Participants

The study group included a convenience sample of 60 elderly people divided into two groups (Table 1). One group consisted of 30 elderly people living in a private-owned nursing home at least 9 months and the other consisted of 30 elderly people living in their own homes and using health care from the same nursing home at least 9 months. All were stroke patients. The stroke had occurred one year before they started to receive help form the nursing home. All study participants living in the nursing home were widowed and had children who were unable to take adequate care of them. Participants living in their own homes lived

TABLE 1. Demographic data of the study participants

	No. of participants living in	
Characteristic	nursing home (n = 30)	own home (n = 30)
Men/women	15/15	9/21
Education level:		
secondary	10	15
university	20	15
Median age (min-max, years)	81 (72-90)	79 (72-86)

with a spouse, with children living elsewhere. According to medical staff, all participants had some form of cognitive deterioration, dementia, or other diagnoses such as diabetes (73%), high blood pressure (93%), and heart disease (74%). Exclusion criteria were Alzheimer disease and psychiatric disorders (psychosis). All participants had disability in everyday functioning, such as difficulty to walk alone, go to toilet alone, have a bath by themselves, and eat without help. Participants who lived in their own home paid for one-month nurse assistance, physical therapist assistance, and physician's assistance. They received help in their own home from the same nursing home. According to information from partners and children, the main reason why those participants did not go to a nursing home was a negative attitude toward that kind of care.

Instruments

World Health Organization Quality of Life questionnaire – short form (WHOQOL-BREF). This instrument is the most frequently used questionnaire on quality of life (3). It consists of 24 items referring to the 4 domains of the quality of life, each domain with 6 items (physical – activities of daily living, dependence on medicinal substances and medical aids, energy and fatigue, mobility, pain and discomfort, sleep and rest, work capacity; psychological – bodily image and appearance, negative feelings, positive feelings, self-esteem, spirituality/religion/personal beliefs, thinking, learning, memory, and concentration; social relationships – personal relationships, social support, sexual activity; and environment – financial resources, freedom, physical safety and security, accessibility and quality of health care, home environment, opportunities for acquiring new information and skills, participation in and opportunities for recreation/leisure activities, physical environment (pollution/noise/traffic/climate/transport); and general assessment of satisfaction with life and health). The level of satisfaction or degree of agreement with each item is indicated on a 1-5 scale. The score for each domain is defined by the sum of individual item scores on a subscale transformed into a scale from 0 to 100, according to questionnaire instructions (3).

The WHOQOL-BREF scale also has 2 items that were separately examined individual's overall perception of quality of life (score min 1 to max 5) and individual's overall perception of health (score min 1 to max 5). The 4 domain scores denote an individual's perception of quality of life in each particular domain. Domain scores are scaled in a positive direction (ie, higher scores denote higher quality of life). The reliability of each subscale is satisfactory and reported to be $\alpha=0.86$ for the physical domain, $\alpha=0.83$ for psychological domain, $\alpha=0.85$ for social relationships, and $\alpha=0.83$ for environment domain (10). In our study, the reliability of each subscale was also high, ie, $\alpha=0.87$ for the physical domain, $\alpha=0.84$ for the psychological domain, $\alpha=0.82$ for social relationships, and $\alpha=0.79$ for the environment.

The WHOQOL instruments are available in over 20 different languages, including Croatian, and can be used for research purposes (29).

Subjective quality of life scale. The questionnaire (30) consists of a single item, ie, the self-assessment of global quality of life on a 1-5 scale. Likert scale scores are expressed as a percentage of scale maximum in a 0%-100% range, where 0 indicates the scale minimum (very dissatisfied with the quality of life) and 100% indicates complete satisfaction with quality of life. The higher are the scores on these two scales, the more pronounced is the assessed aspect (30).

Demographic questionnaire was used to collect information on sex, age, education level, and marital status.

Survey

The cross-sectional study was conducted from January to July 2004 using the convenience sample, ie, the elderly receiving care from the nursing home during the study period. Other nursing homes were not interested to participate in the study. The nursing home included in our study provides a homelike setting for 72 elderly, including 24-hour health services and occupational therapy, and ensures that the elderly receive high quality service. The health care provided is comprehensive, continuous, and easily accessible, combined with psychological support, daily animation and attention, 24-hour supervision, adequate food, and personal hygiene. Twice a week users get internist and psychiatrics checkup, everyday they have exercises with physical therapist, and once a week medical massage of the body. This nursing home also offers care to the elderly who live in their own home, providing them medical and food care. There are about 50 users of this service.

The final study sample included 60 participants (83%) who were cognitively capable to fill in the questionnaire and who wanted to participate in the study.

The purpose of the study was explained to the participants and they all provided informed consent before inclu-

sion in the study. Given the specific characteristics of the study population, the authors or some of the medical stuff (mostly nurses) were present while the participants filled out the questionnaires to provide help as needed. It took 30-45 minutes for each participant to answer the questionnaires. The most of participants filled out questionnaires by themselves but 10 were filled out by researchers according to the specific wish of the participants.

Statistical analysis

Descriptive statistics was used to present data on sex, age, and education level of study participants. The differences in quality of life assessment and quality of life domains between the two groups were assessed with ***t*** test. Regression analysis was used to determine the significance of influence of predictive variables on the criterion variable and to determine the contribution of each predictive variable to the explanation of variance in the criterion variable. All statistical analyses were performed with SPSS, version 15.0 (SPSS Inc., Chicago, IL, USA). Normal distribution of data was confirmed with Kolmogorov-Smirnov goodness-of-fit test ($P=0.430$).

RESULTS

On the subjective quality of life scale, the elderly living in their own homes scored significantly lower than the elderly living in the nursing home (59.3 ± 17.3 vs 78.7 ± 12.8, respectively; t test, $P<0.001$) (Table 2). The elderly living in the nursing home assessed their health significantly better than the elderly living in their own homes (3.6 ± 0.7 vs 2.5 ± 0.9, respectively; t test, $P<0.001$). A single person among the elderly living in their own homes reported being healthy, as opposed to 6 persons among the elderly living in the nursing home.

In comparison with the elderly living in the nursing home, the elderly living in their own homes scored significantly lower on all 4 domains of quality of life measured by WHO-QOL-BREF questionnaire (Table 2). The score <21 indicates dissatisfaction in the physical domain (30). To find an additional explanation of this result, we analyzed individual items on the physical subscale. Both groups reported that they needed some form of medical treatment (item: "How much do you need medical treatment to function in your daily life?") and that it was difficult for them to get around (item: "How well are you able to get around?").

TABLE 2. Mean scores ± standard deviation (SD) of study participants in four quality of life domains (maximum score 100 for each domain)

Quality of life domain	Score (mean±SD) for the elderly living in		
	nursing home	own home	*P**
Physical	28.5 ± 3.25	17.2 ± 5.0	0.001
Psychological	22.3 ± 3.7	16.3 ± 4.0	0.001
Social relationships	11.4 ± 1.6	8.3 ± 1.7	0.001
Environmental	32.8 ± 4.6	24.0 ± 6.1	0.001

**t* test.

The two groups significantly differed in psychological domain, with scores <18 indicating dissatisfaction (30). The elderly living in their own homes had significantly lower scores in the psychological domain than the elderly living in the retirement home (Table 2). The psychological subscale measures meaningfulness of life, satisfaction with oneself and one's bodily appearance, and self-assessed emotional well-being. An analysis of individual items on this subscale showed that the elderly living in their own homes had negative attitude toward life. They reported lack of joy and meaning in life, dissatisfaction with themselves and their bodily appearance, and often feeling blue.

In the domain of social relationships, the elderly living in the nursing home scored higher than the elderly living in their own homes (Table 2). Theoretically, score <9 indicates dissatisfaction in this domain (30). The analysis of individual items on this subscale showed that the elderly living in the nursing home were more satisfied with their personal relationships (4.7 ± 0.6), whereas the elderly living in their own homes were neither satisfied nor dissatisfied with their personal relationships (3.4 ± 0.8) ($P<0.001$). Both groups reported being dissatisfied with their sexual life, although the elderly living in their own homes were significantly more dissatisfied in this domain than the elderly living in the nursing home (1.4 ± 0.7 vs 2.3 ± 1.0, respectively; $P<0.001$).

The last question referred to satisfaction with support from friends. The elderly in both groups reported being satisfied with the support from friends, with the elderly living in the nursing home scoring 4.4 ± 1.0 and the elderly living in their own households scoring 4.0 ± 1.0; $P=0.134$).

Significant differences between the two groups were found in the environment domain (Table 2). Theoretical cut-off value indicating dissatisfaction is 24 (30). The first item in the environment domain referred to having enough money to meet one's needs. This was the first aspect of quality of life in which the elderly liv-

ing in their own households reported satisfaction equal to that reported by the elderly living in the nursing home (4.0 ± 1.2 vs 4.2 ± 0.9, respectively; $P = 0.643$). The second item referred to living conditions. Both groups reported satisfaction with living conditions, with the elderly living in the nursing home being exceptionally satisfied (4.8 ± 0.6) and the elderly living in their own homes being satisfied (4.0 ± 0.7) ($P = 0.002$) . The third item in the environment domain referred to access to health services. The elderly living in their own homes (2.2 ± 1.4) were dissatisfied with their access to health services, whereas the elderly living in the nursing home were exceptionally satisfied with this aspect (4.8 ± 0.5) ($P < 0.001$).

Regression analysis was performed to determine the contribution of demographic variables and different quality of life domains to the explanation of subjective quality of life assessment Demographic variables whose contribution was significant explained 19.7% of total variance. ($R = 0.474$; $R^2 = 0.197$, $F = 4.93$, $P < 0.001$). Within this group of variables, place of living was shown to be a significant predictive variable of quality of life (Table 3). Quality of life domains variables were introduced at the next level of regression analysis and they explained 52% of variance ($R = 0.791$; $R^2 = 0.519$, $F = 15.77$, $P < 0.001$). In addition to this regression being significant, physical, psychological, and environment variables became pronounced, as well as subjective health assessment variable. All these variables were positively associated with subjective quality of life assessment, ie, the more the elderly were satisfied in physical, psychological, and environmental domains and generally more satisfied with their health, the higher they assessed their quality of life.

TABLE 3. **Statistical significance of β coefficients in subjective quality of life assessment for 60 elderly persons who had had the stroke and lived either in the nursing home or in their own home**

Predictive variables	β
Demographic variables:	
education level	-0.055
age	-0.069
place of living	-0.249*
sex	0.188
Quality of life domains:	
education level	-0.106
age	0.076
place of living	-0.011
sex	0.045
physical domain	0.330*
psychological domain	0.257*
social relationships	0.161
environment	0.369†
subjective health assessment	0.502†

*$P < 0.05$.
†$P < 0.01$.

Comparison of these two levels of regression analysis showed that place of living – a variable found to be significant at the first level of analysis – ceased to be significant as a predictor of subjective quality of life assessment at the second level (Table 3). The most important predictive variable was subjective satisfaction with one's health (item: "How satisfied are you with your health?"). The more satisfied the elderly were with their health, the higher were their quality of life scores. Satisfaction in the physical domain relating to subjective indicators of health was a significant predictor of quality of life (Table 3).

DISCUSSION

Our study demonstrated that the elderly living in a nursing home reported higher quality of life than the elderly living in their own homes. Such high satisfaction with living conditions among the elderly living in the nursing home contrasts the traditional thinking that nursing homes provide substantially poorer living conditions than one's own home. On the other hand, this finding is not surprising considering that the nursing home in our study provided 24-hour health services and care, ensured that its residents have a structured social time, and encouraged social interaction. Many elderly people require some kind of care, but either due to poor health or poor socio-economic situation, most refuse moving to different institutions, such as nursing homes or assisted-living facilities (31).

The elderly living in the nursing home self-assessed their health better than the elderly living in their own homes. Since we did not have data on objective health status of the study participants, we could not conclude whether the elderly living in the nursing home were objectively healthier than those living in their own homes or the health care they received made it easier for them to cope with their health problems, which therefore seemed less serious. An alternative explanation is that the elderly in nursing home were surrounded by other disabled or immobile persons or persons in the terminal stage of life, so that they overestimated their own health state and quality of life. As opposed to them, the elderly living in their own homes could not compare themselves with others and were, therefore, prone to assess their situation as more difficult. There

was also the question of whether they received sufficient health care.

The elderly living in the nursing home and those living in their own homes differed in all 4 domains of quality of life. This is not a surprising, because the elderly living in the nursing home had sufficient exercise, interpersonal interaction, and good social life, while the nursing home was architecturally and organizationally adjusted to their needs. The elderly living in the nursing home were significantly more satisfied with their personal relationships, possibly due to the fact that they were taken care of by professionals at the nursing home (health care, meals, etc) and spent more quality time with their family members and friends. Another important thing is that the elderly living in the nursing home had access to health services and health care available 24 hours a day, which most certainly contributed to their feeling of safety and consequently reflected on their quality of life.

The next significant predictor of subjective quality of life was environment. The more satisfied people are with their living conditions, the more satisfied they are with their life in general, but a relatively low β-coefficient shows that environment domain is not such a significant predictor of subjective quality of life after all. Thus, we may assume that by satisfying only material needs, objective quality of life may increase, but it will not necessarily be followed by an increase in the subjective satisfaction with life in general.

Regression analysis showed that all predictive variables explained 52% of variance of life satisfaction. The place of living in the first block of predictive variables was shown to be significant, whereas sex, age, and education level were not. After introducing the second block of variables (physical, psychological, social relationships, and environment domains, and subjective health assessment), the place of living ceased to be significant. Subjective health assessment remained the most important predictive variable, followed by environment, physical, and psychological domains. This showed that, in addition to objective needs, psychological needs also had to be met. Psychological domain items relating to the meaningfulness and enjoyment of life, satisfaction with oneself and one's bodily appearance, and feelings of depression, anxiety, or blue mood were significant predictors of the subjective quality of life. The more satisfied a person in this domain is, the better they will assess their quality of life. However, our results showed that subjective health assessment was more important than the psychological domain. The explanation could lie in the fact that the study participants had health problems, which made their daily functioning more difficult. This is why health was probably a more influential factor.

There are some factors that limit the generalizability of our results and they are associated with the methodology used in our study. First, the study sample was relatively small and participants were conveniently selected. Had we included the elderly living in state-owned retirement homes, the results would have been more generalized and we could have drawn more reliable conclusions. Second, all instruments were based on self-assessment and therefore, were more open to bias. There is also the issue of honesty in answering the questionnaires, cognitive bias, and lack of recognition of real symptoms and feelings. The nursing home where the study was performed was privately-owned, market oriented, and provided more services and better care than state-owned nursing homes. Since we did not have a group of the elderly living in a state-owned nursing home, we cannot make conclusions on the entire elderly population living in nursing homes. The other limitation of this research was that it did not have a control group of healthy elderly, so our conclusion can be made only for small part of elderly population. Regardless of this, our results may be useful to families of elderly persons who refuse to move to a nursing home due to negative perception of this type of accommodation. For the future research, it will be useful to design a prospective follow-up study, as well as enlarge a sample of the elderly (methods of equivalent pairs), by including participants from other nursing homes, preferably state-owned ones, and then compare them with healthy control participants.

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